

Direct Variation vs Partial Variation

Direct Variation

-A relationship between ____ variables in which one variable is a constant multiple of the other.

-x and y values vary _____ with each other

(This means that when x _____, y _____ by the same factor. In other words, y and x always have the same ratio [the slope])

$\frac{y}{x} = m$. One variable is always a constant multiple of the other.)

-represented with form _____

(m is the _____
and the _____)

-When graphing, the line _____ pass through the origin.

Characteristics:

Straight line

Constant of variation (slope)

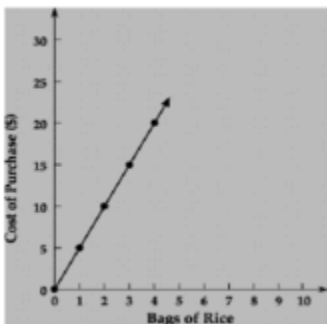
No fixed value

X and y values

Starts at origin (0,0)

$y = mx$

Diagram (graph format)



Partial Variation

A relationship between ____ variables in which one variable is a constant multiple of the other PLUS a _____ value.

--x and y values _____ vary directly with each other.

(This means that when x _____, y _____ by the same factor _____ a constant. One variable is always a constant multiple of the other, PLUS a constant.)

-represented with form _____

(m is the _____
and the _____;
b is the _____
and the _____)

-When graphing, the line _____ pass through the origin.

Characteristics:

Straight line

Constant of variation (slope)

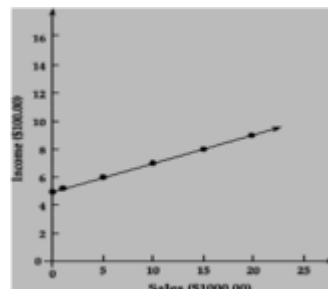
Fixed value

X and y values

Starts anywhere but origin = $mx + b$

$y = mx + b$

Diagram (graph format)



Direct Variation

Examples of direct variation

- monthly salary = hours worked times rate of pay
- distance = number of kilometres driven times rate of speed (km/h)
- total cost of milk = number of cartons purchased times cost per carton
- total amount of money saved = amount deposited per week times number of weeks

Example: Allan the cat earns 2 cat treats an hour for sleeping. How many cat treats does he earn for the first 3 hours?

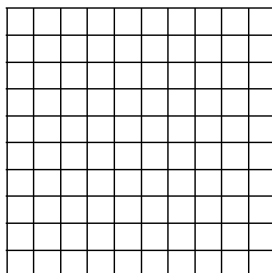


Equation: _____

2 is the cat treats earned (m) and 'x' is the number of hours Allan was sleeping. The cat treats earned is represented by 'y'.

When the equation is graphed it you will see the **graph start at the origin (0,0)** and go up by a multiple (slope) of 2 each time.

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Partial Variation

Examples of partial variation

- car rental charge = number of kilometres driven PLUS basic daily rate plus
- salesman's income = basic monthly income (hours times rate) PLUS percent of sales.
- banquet cost = number of plates of food served (times cost per plate) PLUS fixed hall rental



Example: Allan the cat's grandma takes care of him while his parents are on a trip. Allan now not only earns 2 cat treats an hour for sleeping but also gets 3 bonus treats a day just for being him. How many cat treats does he earn for the first 3 hours?

Now "+3" is a number of bonus treats Allan receives. He can sleep 0 hours and he will still receive those 3 treats. Plus he continues to receive his 2 cat treats an hour.

Equation: _____

3 is the initial value where the graph will start. 2 is the number that shows how many cat treats Allan earns every hour, including the 3 daily cat treats. 'x' is the number of hours and 'y' represents the total amount of cat treats earned every hour, including the 3 daily cat treats.

When the equation is graphed, you would see the **graph will start at 3** and then constantly go up by a multiple (slope) of 2 each time.

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